

Middle Pleistocene Progradational Play

MPL P1, #0561

Angulogerina "B"

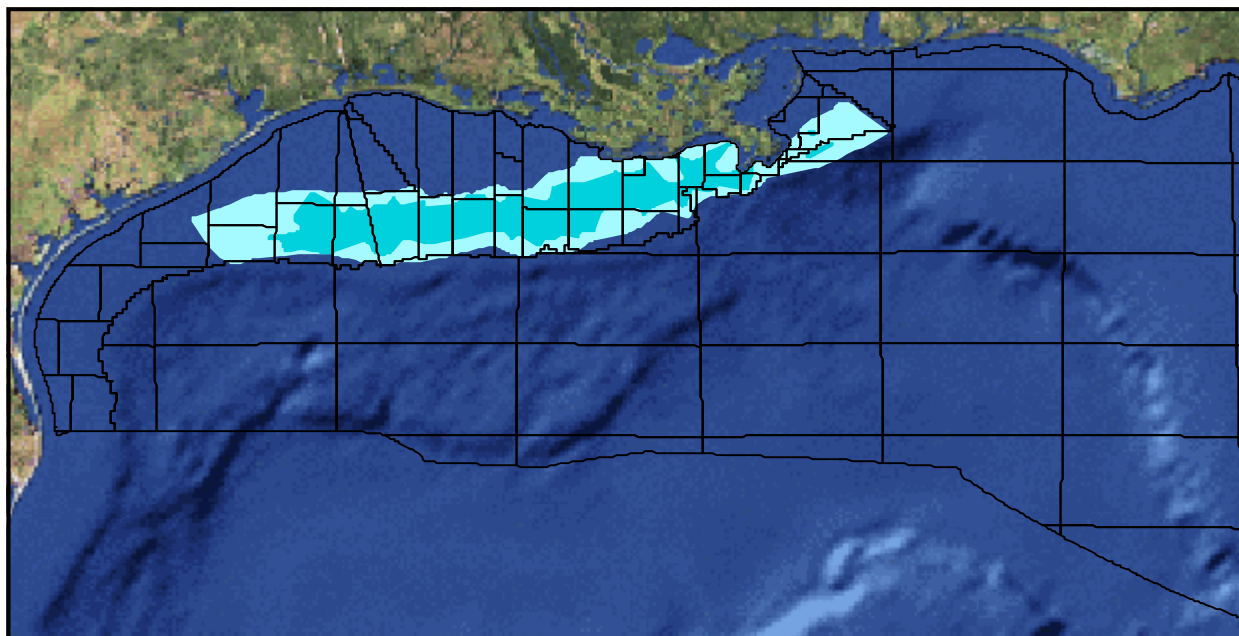


Figure 140. MPL P1 map showing location of play. Play limit shown in light cyan; hydrocarbon limit shown in dark cyan.

Overview

The Middle Pleistocene Progradational Play (MPL P1) contains the third largest amount of reserves of any GOM play ([Figure 2](#)), with 11,887.439 Bcfg and 750.511 MMbo (2,865.714 MMBOE) in 750 sands in 150 fields. Comparing all 65 GOM plays, MPL P1 ranks fourth in gas reserves (7%). The play extends continuously across the modern GOM shelf from the Brazos to Main Pass and Viosca Knoll Area ([Figure 140](#)).

Viosca Knoll Areas east of the modern Mississippi River Delta ([Figure 140](#)). Hydrocarbons have been encountered in much of that same area except, most notably, the Galveston and eastern Main Pass Areas.

The sediments of MPL P1 were supplied mainly from ancestral Mississippi River Deltas. Compared with the location of the older Lower Pleistocene Progradational Play (LPL P1), MPL P1 shifted basinward.

Description

MPL P1 is defined by (1) a progradational depositional style representing major regressive episodes in which sediments outbuild onto the shelf and slope and (2) the MPL-1 and MPL-2 Chronozones, the tops of which are defined by the *Angulogerina* "B" 2nd occurrence and *Angulogerina* "B" 1st occurrence biozones, respectively ([Figure 8](#)).

MPL P1 extends continuously across the modern southernmost GOM shelf from the east-central Brazos Area offshore Texas to the Main Pass and

Play Limits

MPL P1 deposits grade into the sediments of the Middle Pleistocene Aggradational Play (MPL A1) in an updip direction. MPL P1 also extends onshore in some areas of Louisiana. The play does not extend farther to the west because of an apparent lack of shelf source sands in offshore Texas during MPL time. At its farthest northeast extent, the play pinches out. MPL P1 deposits grade into the sediments of the Middle Pleistocene Fan 1 (MPL F1) and Middle Pleistocene Fan 2 (MPL F2) Plays in a downdip direction.

Depositional Style

MPL P1 is characterized by sediments deposited predominantly on the MPL shelf, with less common, generally finer-grained sediments deposited on the MPL upper slope. These sediments represent major regressive episodes in which outbuilding of both the shelf and the slope occur. Additionally, retrogradational, reworked sands with a thinning and backstepping log signature locally cap the play. Because these retrogradational sands are poorly developed, discontinuous, and not correlatable for any significant distance, they are included as part of MPL P1.

The MPL progradational interval varies from less than 150 to more than 7,500 ft in thickness, with net sand thicknesses as much as approximately 2,000 ft. A large sea-level drop during the late Pleistocene produced localized erosion of the MPL section. In places, the entire MPL section has been removed. Individual sand-dominated successions range from a few tens of feet to approximately 1,000 ft in thickness. They are separated by shaly intervals that are approximately several hundred feet thick. Progradational depositional facies, predominantly comprising delta fringe sands, channel/levee complexes, and distributary mouth bars, characterize MPL P1. These facies exhibit upward-coarsening (delta fringe and distributary mouth bar) and blocky to upward-fining (channel/levee) log signatures. The thickest sand-dominated intervals probably represent stacked facies of multiple episodes of delta-lobe switching and progradation. The play less commonly contains crevasse splay deposits, shelf blanket sands, and delta slump deposits that are characterized by isolated, prominent, and subdued spiky log patterns.

Structural Style

Almost half of the fields in this play are structurally associated with salt diapirs—shallow, intermediate, and deep depths—with hydrocarbons trapped on diapir flanks or in sediments draped over diapir tops. Other fields are structurally associated with anticlines, growth fault anticlines, and normal faults. Some fields also contain hydrocarbon accumulations trapped by permeability barriers and updip pinchouts or facies changes.

Quantitative Attributes

On the basis of reserves calculations, MPL P1 contains 74% gas and 26% oil. The 750 sands in

the play comprise 1,638 reservoirs, of which 1,093 are nonassociated gas, 402 are undersaturated oil, and 143 are saturated oil. Proved reserves are estimated at 11,865.380 Bcfg and 750.361 MMbo (2,861.638 MMBOE) in 748 sands in 148 fields ([Table 63](#)). Unproved reserves are estimated at 22.060 Bcfg and 0.150 MMbo (4.075 MMBOE) in 2 sands in 2 fields. These proved plus unproved reserves account for over 80% of the reserves for the MPL Chronozone.

	No. of Sands	Oil (MMbbl)	Gas (Bcf)	BOE (MMbbl)
Proved	748	750.361	11,865.380	2,861.638
Cum. production	726	670.206	10,503.777	2,539.206
Remaining proved	418	80.154	1,361.603	322.433
Unproved	2	0.150	22.060	4.075

Table 63. MPL P1 reserves and cumulative production.

Of all 65 GOM plays, MPL P1 ranks fourth in gas production (8%) and fifth in oil production (6%). Cumulative production from MPL P1 totals 10,503.777 Bcfg and 670.206 MMbo (2,539.206 MMBOE) from 726 sands in 146 fields. MPL P1 production accounts for 86% of the MPL Chronozone's total production. Remaining proved reserves in the play are 1,361.603 Bcfg and 80.154 MMbo (322.433 MMBOE) in 418 sands in 111 fields.

[Table 64](#) summarizes that water depths of the fields in MPL P1 range from 39-740 ft, and play interval discovery depths vary from 2,102-14,946 ft, subsea. Additionally, porosity and water saturation range from 15-38% and 16-71%, respectively.

750 Sands	Min	Mean	Max
Water depth (ft)	39	202	740
Subsea depth (ft)	2,102	5,861	14,946
Reservoirs per sand	1	2	17
Porosity	15%	31%	38%
Water saturation	16%	29%	71%

Table 64. MPL P1 sand attributes. Values are volume-weighted averages of individual reservoir attributes.

Exploration History

MPL P1 has a 51-year history of discoveries ([Figure 141](#)). The first sand in the play was discovered in 1948 in the South Timbalier 52 Field. The maximum number of sands discovered in any year occurred in 1971 with 63 sands from 18 fields, adding the maximum yearly reserves of 717.166 MMBOE. In fact, sand discoveries per year peaked

in the 1970's and early-most 1980's, when 445 of the play's 750 sands were discovered.

The three largest sands in the play were discovered in 1971 and each contains greater than 100 MMBOE (Figure 142). The two largest sands were discovered in the Eugene Island 330 Field and contain an estimated 164.675 MMBOE and 133.465 MMBOE, while the third largest sand was discovered in the Eugene Island 296 Field and contains an estimated 102.042 MMBOE. No sand containing more than 25 MMBOE has been discovered since 1975. The mean sand size for the play is 3.821 MMBOE. Since the first Atlas database cutoff of January 1, 1995, 65 sands have been discovered, the largest of which is estimated to contain 5.587 MMBOE.

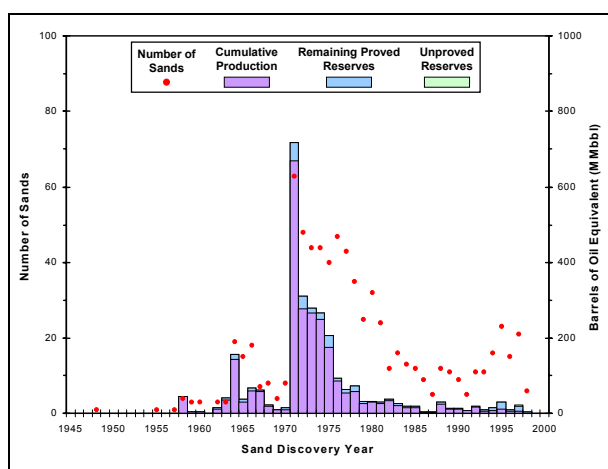


Figure 141. MPL P1 exploration history graph showing reserves and number of sands discovered by year.

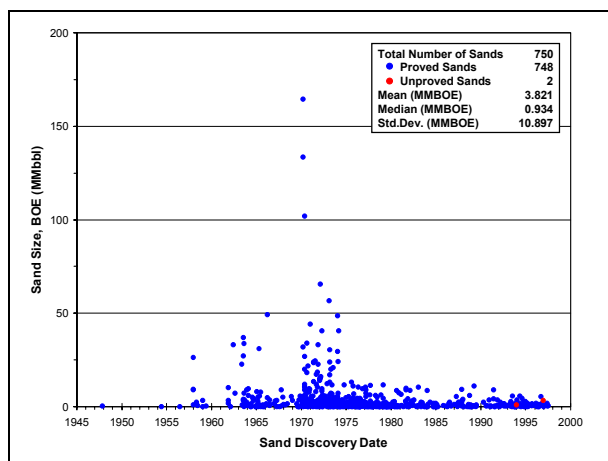


Figure 142. MPL P1 sand discovery graph showing the size of sands discovered by year.

Production History

MPL P1 has a 43-year history of production (Figure 143). Oil and gas production began in 1955 with relatively low yearly values, actually ceasing in 1959. However, just as most of the play's sands were discovered in the 1970's and early-most 1980's, the play's yearly oil and gas production levels also sharply increased during this same time, peaking in the late-1970's. Since then, both oil and gas production have declined to less than half their peak values.

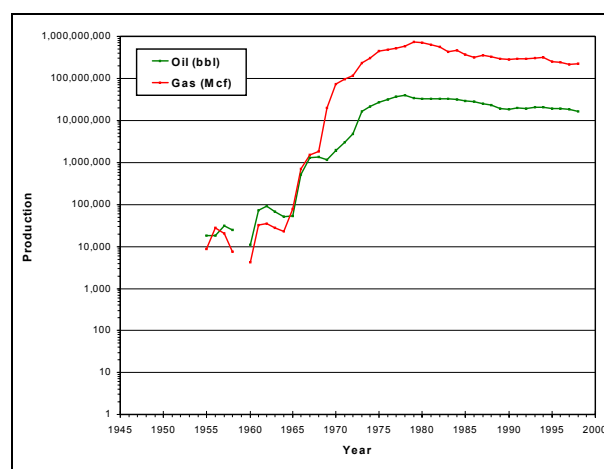


Figure 143. MPL P1 production graph showing oil and gas production by year.